

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
21 October 2004 (21.10.2004)

PCT

(10) International Publication Number  
**WO 2004/089214 A3**

(51) International Patent Classification<sup>7</sup>: **A61B 5/117**,  
3/00, G06K 9/00

(21) International Application Number:  
PCT/EP2004/003415

(22) International Filing Date: 31 March 2004 (31.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/462,551 11 April 2003 (11.04.2003) US

(71) Applicant (for all designated States except US): **BAUSCH & LOMB INC.** [US/US]; One Bausch & Lomb Place, Rochester, NY 14604-2701 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BJÖRN, Kahlen** [DE/DE]; Con Trace GmbH, Hinrich-Ahrnke-Strasse 2, 28757 Bremen (DE).

(74) Agent: **VOSSIUS & PARTNER**; Siebertstrasse 4, 81675 Munich (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

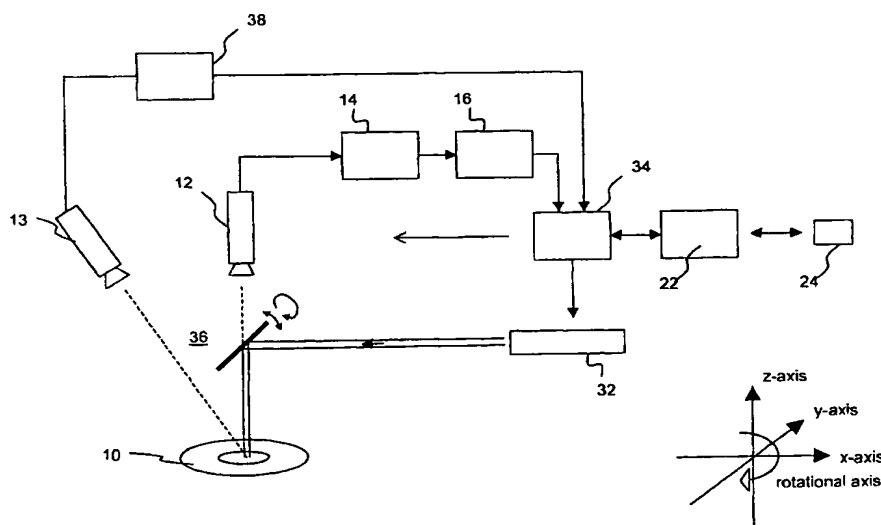
**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
6 January 2005

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR ACQUIRING DATA AND ALIGNING AND TRACKING OF AN EYE



(57) Abstract: A system and a corresponding method is provided for aligning and/or tracking of an eye of a patient with reference to an ophthalmic unit for performing diagnosis and/or treatment of the eye. The system comprises means for providing a previously acquired iris code of the eye, an iris recognition unit for acquiring an iris code of the eye under investigation and a comparator for comparing the previously acquired iris code with the present iris code and to provide a comparison result. The ophthalmic unit performs said diagnosis and/or treatment of the eye when said comparison result is greater than an identification determining level.



---

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2004/003415

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B5/117 A61B3/00 G06K9/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B G06K G09K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/28476 A (HOHLA KRISTIAN ; NEUHANN THOMAS (DE); TECHNOLAS GMBH OPHTHALMOLOGISC ()) 26 April 2001 (2001-04-26) page 2, line 5 - page 5, line 2; figures 2,5-8,10,12	1,3-10, 12-17, 25,27
Y	page 6, line 5 - page 11, line 12  claims 1-4,10-12,22,23,31,40 page 14, paragraph 3 - page 21, paragraph 2 page 25, paragraph 3 - page 30, last paragraph  ----- -/--	2,7,11, 15



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

28 October 2004

Date of mailing of the international search report

09 NOV 2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Neef, T

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/003415

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/087442 A (GROTEHUSMANN ULF ; YOUSEFFI GERHARD (DE); BAUSCH & LOMB (US)) 7 November 2002 (2002-11-07)  page 1, paragraph 1 - page 9, last paragraph; figure 1	1-5, 7-13, 16-19, 25-27
Y	page 11, paragraph 3 - page 20, paragraph 1; figures 1-5	2,7,11
X	WO 01/89373 A (SENSOMOTORIC INSTR GMBH ; LUTZ PETER (DE); TAYLOR NATALIE (DE); TEIWES) 29 November 2001 (2001-11-29)	1-3,6, 8-13,16, 17,25,26
A	page 2, paragraph 4 - page 14, last paragraph; figure 1	4,5,7, 18,19 15
Y		
X	US 5 291 560 A (DAUGMAN JOHN G) 1 March 1994 (1994-03-01)	17-19,27
A	column 2, line 31 - column 3, line 45; figures 1,2,4,6,11  column 9, line 30 - column 18, line 22 column 5, line 1 - column 8, line 69	1-4, 7-11,16, 25,26
A	WILLIAMS G O: "IRIS RECOGNITION TECHNOLOGY" IEEE AEROSPACE AND ELECTRONIC SYSTEMS MAGAZINE, IEEE INC. NEW YORK, US, vol. 12, no. 4, 1 April 1997 (1997-04-01), pages 23-29, XP000677464 ISSN: 0885-8985 the whole document	8-11, 16-19, 26,27
A	WILDES R P: "IRIS RECOGNITION: AN EMERGING BIOMETRIC TECHNOLOGY" PROCEEDINGS OF THE IEEE, IEEE. NEW YORK, US, vol. 85, no. 9, 1 September 1997 (1997-09-01), pages 1348-1363, XP000738562 ISSN: 0018-9219 the whole document	8-11, 16-19, 26,27

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2004/003415

### Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 25

system for acquiring data of a patient's eye and method using the system  
---

2. claims: 8-16, 26

system for aligning and tracking of patient's eye by comparing iris representations/codes and method using the system  
---

3. claims: 17-24, 27

Iris recognition unit generating an iris representation and method using the system  
---

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/003415

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0128476	A	26-04-2001	DE 19950791 A1	10-05-2001
			DE 19950790 A1	21-06-2001
			DE 10014479 A1	04-10-2001
			AU 1514801 A	30-04-2001
			BR 0014890 A	02-07-2002
			CA 2387742 A1	26-04-2001
			CN 1379647 T	13-11-2002
			DE 1221922 T1	27-11-2003
			WO 0128476 A1	26-04-2001
			EP 1221922 A1	17-07-2002
			ES 2199095 T1	16-02-2004
			JP 2003511206 T	25-03-2003
			AU 1026401 A	30-04-2001
			BR 0015065 A	16-07-2002
			CA 2385909 A1	26-04-2001
			CN 1382027 T	27-11-2002
			WO 0128410 A1	26-04-2001
			EP 1221890 A1	17-07-2002
			JP 2003511183 T	25-03-2003
WO 02087442	A	07-11-2002	BR 0116991 A	13-07-2004
			CA 2444961 A1	07-11-2002
			DE 01274188 T1	15-07-2004
			WO 02087442 A1	07-11-2002
			EP 1383429 A1	28-01-2004
			ES 2214164 T1	16-09-2004
WO 0189373	A	29-11-2001	US 2004169817 A1	02-09-2004
WO 0189373	A	29-11-2001	AU 6747301 A	03-12-2001
			WO 0189373 A2	29-11-2001
US 5291560	A	01-03-1994		
			CA 2145659 A1	28-04-1994
			WO 9409446 A1	28-04-1994
			AU 2808092 A	09-05-1994
			EP 0664037 A1	26-07-1995
			JP 3307936 B2	29-07-2002
			JP 8504979 T	28-05-1996
			AT 211279 T	15-01-2002
			DE 69232314 D1	31-01-2002
			DE 69232314 T2	20-06-2002
			DK 664037 T3	11-03-2002
			HK 1013156 A1	31-05-2002